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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,133	06/15/2005	Kazushi Wada	09792909-6288	2272

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EXAMINER
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KUO, WENSING W

ART UNIT	PAPER NUMBER
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2826

MAIL DATE	DELIVERY MODE
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11/06/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/539,133

Applicant(s)

WADA, KAZUSHI

Examiner

W. Wendy Kuo

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 15 June 2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election **without traverse of Species A, claims 1-11** in the reply filed on 08 October 2007 is acknowledged.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **4 of Figure 2B** (mentioned in paragraph [0029]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 6-7, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Inagaki (US 6,765,246) (hereinafter Inagaki).

5. With respect to claim 1, Inagaki (e.g. Figure 1) teaches a solid state image pickup device having an image pickup region comprised of a plurality of photo-sensors 1 and a transfer register 2 for transferring signal charges accumulated in said photo-sensors (column 5, lines 49-51), said image pickup region formed on the face layer side (surface) (column 5, lines 41-46) of a substrate, wherein said solid state image pickup device further comprises:

an impurity region portion 13 (horizontal gridlines between adjacent photodiodes in vertical direction) formed continuously in a direction orthogonal to the transfer (vertical) direction of said transfer register (column 6, lines 39-52), said impurity region portion provided at a position corresponding to a position between said photo-sensors 1 adjacent to each other along the transfer direction of said transfer register in said substrate.

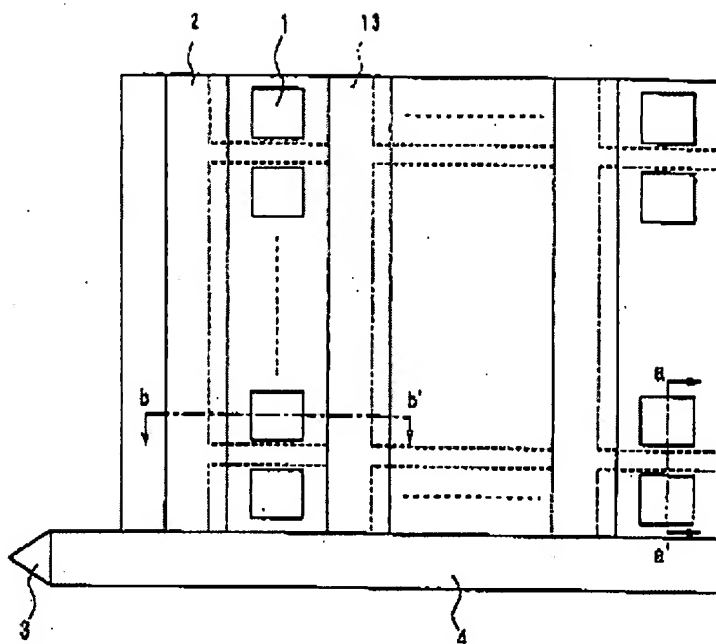


FIG. 1

6. With respect to claim 2, Inagaki (e.g. Figures 2 and 3) further teaches that the impurity region portion 13 is formed at a position deeper than said transfer register (vertical CCD) (column 6, lines 2-4 and lines 39-42) as viewed from the face (surface) layer portion side of said substrate.



7. With respect to claim 3, Inagaki (e.g. Figure 6) further teaches a plurality of said impurity region portions (13a-13c) are formed in the depth direction of said substrate (column 11, lines 4-8).

8. With respect to claim 4, Inagaki (e.g. Figure 2) further teaches that separately from said impurity region portion, a channel stop region portion 12 comprised of an impurity region is formed between said photo-sensors (photodiodes) adjacent to each other along the transfer (vertical) direction of said transfer register (column 6, lines 34-38) and in the vicinity of the surface of said substrate.

9. With respect to claim 6, Inagaki (e.g. Figure 6) further teaches that in addition to said impurity region portion 13, a first barrier portion 15 comprised of an impurity region is provided at a position between said photo-sensors (photodiodes) adjacent to each other in the transfer direction of said transfer register and shallower relative to said impurity region portion as viewed from the face layer portion (surface) side of said substrate (column 6, lines 46-49).

10. With respect to claim 7, Inagaki (e.g. Figure 1) further teaches a second barrier layer 13 (vertical gridlines between adjacent photodiodes in horizontal direction) (column 6, lines 39-52) comprised of an impurity region portion formed along said transfer register.

11. With respect to claim 11, Inagaki further teaches that the impurity region portion (13 horizontal gridlines) and the second barrier region portion (13 vertical gridlines) are located at the same depth as viewed from the face (surface) layer portion side of said substrate (column 10, lines 56-64).

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

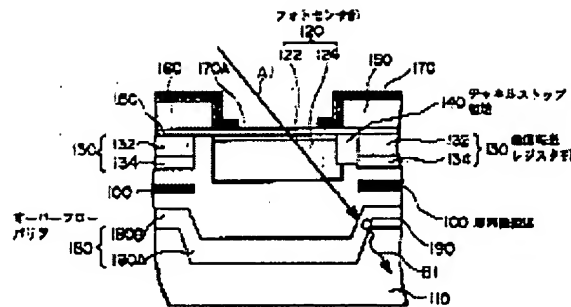
13. Claims 5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki in view of Komatsu (JP 02002231924) (abstract) (hereinafter Komatsu).

14. With respect to claims 5 and 8, Inagaki remains as applied to claims 1 and 7, respectively, above.

Inagaki (e.g. Figures 2 and 3) further teaches an overflow barrier 6 formed in said substrate on the deep layer portion side relative to said photo-sensors and said transfer register.

Inagaki fails to teach that the overflow barrier is in a projected and recessed shape at an interface thereof in the depth direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors. Komatsu teaches that the overflow barrier is in a projected (shallow) and recessed (deep) shape at an interface thereof in the depth direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors (see abstract figure) in order to prevent color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.





It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the image pickup device of Inagaki with the overflow barrier of Komatsu for the benefit of preventing color mixing and smear by limiting the move of a signal charge between adjacent photosensor sections.

15. With respect to claims 9 and 10, Inagaki as modified by Komatsu remains as applied to claims 5 and 8, respectively, above. Inagaki further teaches that the impurity region portion 13 is higher than said overflow barrier 6 in impurity concentration (column 7, lines 48-51 and 55-58).

### **Conclusion**

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abe (US 6,436,729) discloses an image pickup device that can enhance a photoelectric conversion region by forming an overflow barrier layer at a deep position.

Goto (US 7,236,197) discloses a solid-state image sensor using a junction gate type field-effect transistor as a pixel.


Application/Control Number:  
10/539,133  
Art Unit: 2826

Page 9

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571) 270-1859. The examiner can normally be reached Monday through Friday 7:00 AM to 4:30 PM EST.

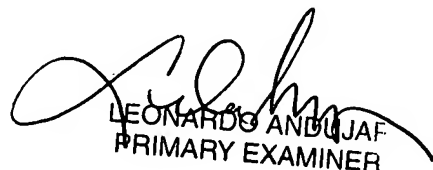
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached at (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



W. Wendy Kuo  
Examiner  
Art Unit 2826

WWK



LEONARDO ANDUJAR  
PRIMARY EXAMINER